



Date of filing Complete Specification : Feb. 25, 1952.

Application Date : April 16, 1951. No. 8805/51.

Complete Specification Published : Nov. 25, 1953.

Index at Acceptance :— Class 102(1), A1C3, A3(C : F1A); A4(C : H : L : P : Q).

COMPLETE SPECIFICATION.

**An Electrically Operated Spraying Device Incorporating a Reciprocating Pump for Spraying Paint and other Liquids.**

I, LISTER WELCH, a British Subject, of 12 Kingsmere Road, Parkside, Wimbledon, S.W.19, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to spraying devices for spraying paint, disinfectants, insecticides and other liquids and comprises an improved electrically operated spraying device of the kind incorporating a reciprocating pump actuated by a vibratory electric motor which includes a vibratory armature movable by the attraction of an alternating current electromagnet against the action of a spring which constantly thrusts a plunger or piston rod of the pump into engagement with the armature and tends constantly to thrust the armature away from the magnet.

The invention consists in a construction wherein the electromagnet is contained in a cavity in the head and wherein the pump is inserted into a chamber provided for it in the head adjacent the electromagnet, the vibratory armature being located between the magnet and an upper wall of the head and having a projecting part adapted to bear against the plunger or piston rod of the pump when the latter is pushed into its place in the chamber provided for it. The armature may be mounted freely in the head, its movement being controlled by an internal abutment on the upper wall of the head located over the end of the armature remote from the pump and designed to act as a fulcrum for the armature. This construction is simple and compact and allows the pump to be removed easily so that it is readily accessible for cleaning. The pump may carry a suction tube for drawing the

liquid from a receptacle, and a delivery tube and spray nozzle for delivering the liquid, the pump, suction tube and delivery tube and spray nozzle being detachable as a unit by withdrawing the pump from the chamber provided for it in the head.

The head may be formed with a handle by which the complete assembly, comprising the head carrying the pump and motor, and the jar or other receptacle for the liquid to be sprayed, can be carried in the hand.

The invention and its subsidiary features will be fully understood from the following more detailed description, by way of example, of one form of construction embodying the invention, reference being made to the accompanying drawing in which the only figure is an "exploded" view, partly in section, showing the various easily separable parts of the device detached from one another but so arranged as to render their method of assembly readily apparent.

As shown in the drawing, the device comprises a head having a hollow cylindrical body 1 made of a synthetic resin and formed with a laterally and downwardly projecting carrying handle 2. The body 1 contains an alternating current electromagnet 3 having a laminated yoke 4 fixed in the body and co-operating with a vibratory armature 5 located between the magnet 3 and the upper wall of the body 1.

At one side of the magnet 3, the body 1 is formed with a cylindrical chamber 6 into which the body of a pump 7 can be inserted through a hole in the base of the body 1.

The pump 7 is a piston or diaphragm pump actuated by a piston rod or plunger 8 and designed to operate with an extremely rapid short-stroke vibratory movement of the piston or diaphragm.

When the pump 7 is in its working position in the chamber 6, the plunger 8 pro-

[Price 2s. 8d.]

Price 25p

jects upwards through a hole 9 in the interior of the body 1 and engages a rocker arm 10 projecting from one end of the armature 5 into a recess 11 provided for it in the body 1.

5 The pump plunger 8 is controlled by a spring 12 which presses the plunger into engagement with the arm 10 and constantly urges the armature 5 upwards against the attraction of the magnet 3. The armature

10 5 is freely mounted in the body 1, that is it is free to move, its movement being controlled by an internal abutment 13 on the upper wall of the body located over the end of the armature remote from the pump 7

15 and designed to act as a fulcrum for the armature.

The pump 7 is held in its working position in the chamber 6 by a cap 14 which is adapted to be secured to the base of the

20 body 1 by a screw 15 and is designed for attachment to the mouth of a jar or container for liquid to be sprayed. As shown, the cap 14 is designed to screw onto the mouth of the jar by engagement with a

25 screw thread 17 formed externally on the neck of the jar, a gasket 18 being inserted between the cap and the upper edge 19 of the mouth of the jar to seal the joint between the cap and the jar.

30 The body of the pump 7 carries a suction tube 20 which projects downwards through the cap 14 and thus projects into the jar 16 when the cap 14 is secured to the jar. The lower end of the suction tube 20, which

35 is thus designed to be immersed in the liquid in the jar, carries a detachable screen or filtering device 21 adapted to be secured to the suction tube 20 by a nut 22 to prevent the entry of solid matter into the suction

40 tube. The body of the pump also carries a delivery tube 23 which is adapted to project through a slot 24 provided for it in the wall of the body and terminates in an external nozzle or spraying device 25 which may be adjust-

45 able to enable either a jet or a fine spray to be produced.

The electromagnet 3 is designed to be supplied with alternating current from a mains supply through a flexible cable 26

50 inserted through the carrying handle 2. The carrying handle 2 also contains a control switch 27 operated by a push-button 28 by which the current supply to the magnet 3 can be switched on or off at will.

55 When the current is switched on, the armature 5 is vibrated by the effect of the alternating current against the action of the spring 12 which constantly tends to rock the armature about its fulcrum 13 against

60 the attraction of the magnet. A vibratory

reciprocating movement is thus transmitted to the pump piston or diaphragm and causes the pump to draw liquid from the jar 16 and force it through the nozzle 25.

It will be appreciated from the above description that the pump 7, with its suction tube 20, delivery tube 23, filter 21 and nozzle 25, can be readily removed as a unit for cleaning or adjustment, by simply withdrawing the pump 7 from its chamber 6 in the head 1 after first detaching the cap 14 from the body 1 of the head.

What I claim is:—

1. An electrically operated liquid spraying device of the kind referred to wherein the electromagnet is contained in a cavity in a head and wherein the pump is inserted into a chamber provided for it in the head adjacent the electromagnet, the vibratory armature being located between the magnet and an upper wall of the head and having a projecting part adapted to bear against the plunger or piston rod of the pump when the latter is pushed into its place in the chamber provided for it.

2. An electrically operated spraying device as claimed in Claim 1, wherein the armature is mounted freely in the head, its movement being controlled by an internal abutment on the upper wall of the head located over the end of the armature remote from the pump and designed to act as a fulcrum for the armature.

3. An electrically operated spraying device as claimed in Claim 1, wherein the pump carries a suction tube for drawing the liquid from a receptacle and a delivery tube and spray nozzle for delivering the liquid, the pump, suction tube and delivery tube and spray nozzle being detachable as a unit by withdrawing the pump from the chamber provided for it in the head.

4. An electrically operated spraying device as claimed in Claim 1, wherein the head is formed with a handle by which the complete assembly, comprising the head carrying the pump and motor, and a jar or other receptacle for the liquid to be sprayed, can be carried in the hand.

5. An electrically operated spraying device substantially as herein described with reference to the accompanying drawing.

EDWIN C. AXE, ASSOC. I.MECH.E.,  
27 Chancery Lane, London, W.C.2.  
Agent for the Applicant.

## PROVISIONAL SPECIFICATION.

# An Electrically-Operated Spraying Device Incorporating a Reciprocating Pump for Spraying Paint and other Liquids.

I, LISTER WELCH, a British Subject, of 12 Kingsmere Road, Parkside, Wimbledon, S.W.19, do hereby declare this invention to be described in the following statement:

5 This invention relates to spraying devices for spraying paint, disinfectants, insecticides and other liquids, and comprises an improved electrically operated spraying device embodying a pump actuated by a vibratory electric motor.

10 The invention will be understood from the following description of one example of a construction embodying the invention.

In this example, the device comprises a head containing the vibratory electric motor, a pump unit detachably mounted in the head and a cap for attaching the head with the pump unit therein to a jar or other receptacle for the liquid to be sprayed, the complete assembly, including the jar or receptacle, being designed to be carried in the hand.

25 The head has a hollow cylindrical body made of an electrically insulating plastic and formed with a laterally and downwardly projecting carrying handle. The body contains an alternating-current electromagnet having a laminated yoke fixed in the body and co-operating with a vibratory armature located between the magnet and the upper wall of the body.

30 At one side of the magnet, the body is formed with a cylindrical chamber into which the cylinder of a plunger-pump is inserted through a hole in the base of the body. The pump plunger has a spring-loaded stem which projects upwards from the pump cylinder and is constantly urged by the pressure of its loading spring into engagement with a rocker arm projecting from one end of the armature into a recess provided for it in the body. The armature may be freely mounted in the body, its movement being controlled by an internal abutment on the upper wall of the body located over the end of the armature remote from the pump and designed to act as a fulcrum for the armature.

The pump cylinder is held in place in the body by means of a cap detachably secured to the base of the body by a screw or the like and designed for attachment to the mouth of a jar or other container for liquid to be sprayed. The cap may for instance be designed to screw onto the mouth of the jar.

55 The pump cylinder carries a suction tube which projects downwardly through the cap and thus projects into the jar when the cap is secured to the jar. The lower end of the suction tube, which is thus designed to be immersed in the liquid in the jar, may carry a detachable screen or filtering device for preventing the entry of solid matter into the suction tube. A delivery tube projects laterally from the pump cylinder through a slot provided for it in the wall of the body and terminates in an external nozzle or spraying device which may be adjustable to enable either a jet or a fine spray to be produced.

70 The electromagnet is designed to be supplied with alternating-current from a mains supply through a flexible cable inserted through the carrying handle. The carrying handle also contains a control switch operated by a push-button by which the current supply to the magnet can be switched on or off at will.

80 When the current is switched on, the armature is vibrated by the alternating current against the action of the loading spring of the pump stem which constantly tends to rock the armature about its fulcrum against the attraction of the magnet.

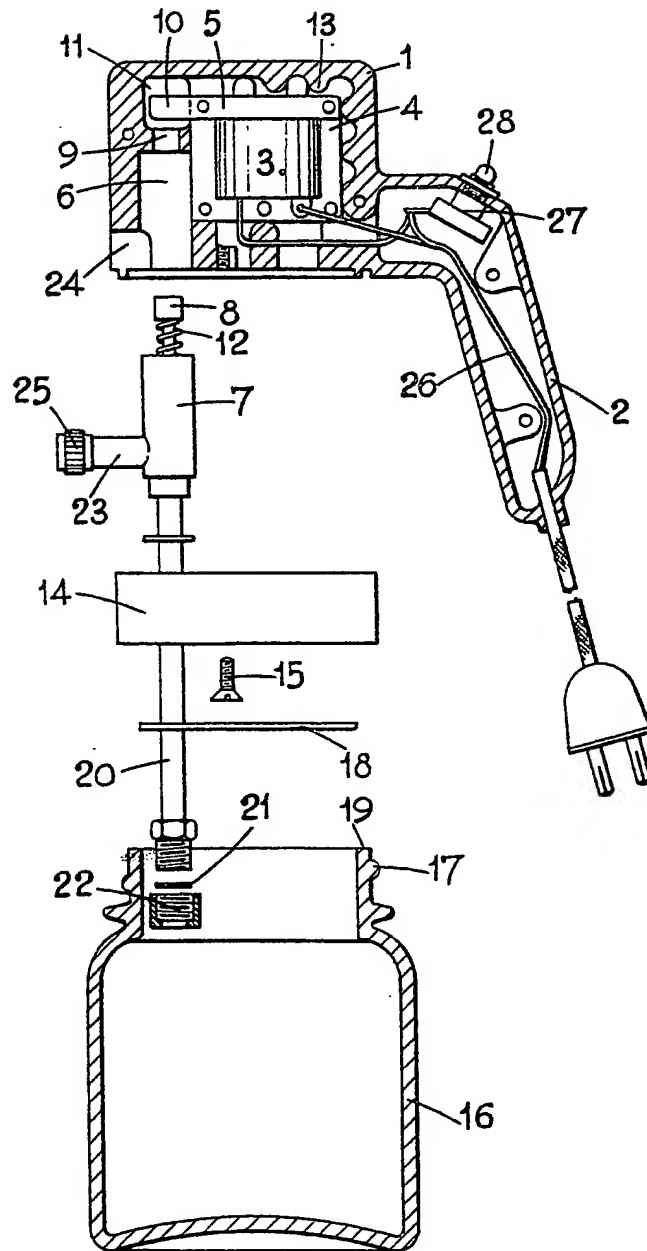
85 The plunger pump with its suction tube, delivery tube, filter and nozzle can be readily removed as a unit for cleaning or adjustment by simply withdrawing the pump cylinder from its chamber in the head after first detaching the cap from the base of the head.

EDWIN C. AXE, ASSOC.I.MECH.E.,  
27 Chancery Lane, London, W.C.2.  
Agent for the Applicant.

Abingdon: Printed for Her Majesty's Stationery Office, by Burgess & Son (Abingdon), Ltd.—1953.  
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2,  
from which copies may be obtained.

Y900 E 1944444 1-2-5

BEST AVAILABLE COPY



**BEST AVAILABLE COPY**